

10 Rec'd

2 MAY 2005



REC'D 27 AUG 2003

WIPO PCT

Kongeriget Danmark

Patent application No.: PA 2002 01202

Date of filing: 12 August 2002

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Taastrup 28 August 2002


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PATENT- OG VAREMÆRKESTYRELSEN

Device for administration of fluids

Modtaget

12 AUG. 2002

Field of invention

PVS

5 The present invention relates to devices for oral administration of fluids; preferably
an administration to individuals including animals in need thereof. The invention also
relates to methods for administration and to the use of said devices in such
methods. More specifically, the present invention relates to devices for orally
administering fluids to domestic animals. The present invention in one interesting
10 embodiment relates to devices for orally administering colostrum to new-born
calves.

Background of invention

15 *The importance of feeding newborn calves colostrum*

It is known that the transfer of immunoglobulin across the placenta to the developing
bovine foetus is minimal, so bovine neonates are born essentially
agammaglobulinemic (Brambel, F.W.R. (1970), p201-365 in *Frontiers in Biology*.
Vol.18, A. Neuberger and E.L.Tatum, ed. North Holland Publ. Co., Amsterdam, The
20 Netherlands; Kruse, V (1970). *Anim. Prod.* 12:619-626). Given this fact, it is vital
that newborn calves can acquire passive immunity from the immunoglobulin
contained in the colostrum of the dam. Certainly, Penhale et al have concluded that
the most important factor in resistance to infections at this early stage in the calf's
life is its level of IgG (Penhale et al., (1970) *Br.Vet.J.* 126:30-37), and Rea et al have
25 reported that a mortality risk is associated with calves with IgG concentrations of
less than 5 g/L. (Rea et al., (1996) *JAVMA.* 28:2047-2049). Certainly, calf mortality
is a significant economic problem to the farming industries, with high mortality rates
within the first week after birth (Wells et al., (1996) *Prev. Vet. Med* 29:9-19).

30 It has also been demonstrated that the feeding of colostrum to newborn calves is
associated with more efficient weight increases of the calves. Pedersen et al. (2000)
have examined populations of calves fed either colostrum or milk replacer and
observed that those calves receiving colostrum at birth gained weight in the first
week after birth, compared to calves on milk replacer which lost weight during the
35 same period (Pedersen et al.,(2000), *J. Dairy Sci* 83:2829-2833). Pedersen et al

postulate that this difference could have been caused by either the high nutrient density in the colostrum and/or by the enhancing of the calves' immune device by the calves acquiring immunoglobulin from the colostrum. Certainly, the calves fed colostrum had a higher plasma immunoglobulin concentration after 24 and 48 hours than those fed milk replacer.

Advantages of using an esophageal feeder to deliver colostrum to newborn calves

Passive immunisation of calves is most efficient immediately after birth, and ceases by about 24 hours after birth (Deutsch et al., (1983) *in* Veterinary medicine, 6th ed. 1197-1296, pub. Bailliere Tindall, London), thus it is important for the calf to receive enough colostrum within this short time. However, suckling calves often consume only small amounts of colostrum (Gay (1983) Proc.Fourth Int. Symp. Neonatal Diarrhea. Univ. Saskatchewan. 346-364), and although monitoring of the quantity of colostrum consumed can be done using a nipple bottle, the calves cannot be force-fed enough colostrum using this method. Thus, force-feeding of calves using an esophageal feeder during the critical time-period immediately after birth may ensure that the calves consume enough colostrum to gain sufficient passive immunity. Use of an esophageal feeder is also a relatively quick process and as it requires only a short period of time on behalf of the operator it is cost effective.

Problems associated with current esophageal feeders

There are problems associated with the esophageal feeders known to those skilled in the art. It is desirable that while using these types of device, the operator should have both hands free, e.g. as in the case of when using these devices with calves, it is desirable to "minimize the calf being able to move and toss its head...(as)...this can cause injury". (Frank, R., Dairy Herd Management, Oct.1997, pub. Vance Publishing Corp.). In addition, farmers may be concerned about "accidentally placing the tube down the trachea", and it is suggested that to solve this problem the operator has "someone else hold the bag of milk. This way you can use both of your hands to feel the tube moving into the esophagus" ". (Frank, R., Dairy Herd Management, Oct.1997, pub. Vance Publishing Corp.) However, this is clearly a labour-intensive process and it is clearly desirable and more cost-effective for an operator of an esophageal feeder to work alone. Thus, a feeding device carried by the operator in a way allowing his hands to be free, whilst still allowing the device to

be easily accessible, is highly desirable. Such a device must also be easily sanitized, to prevent infection of the young calves.

5 Certainly, there have been some attempts at meeting some of these needs in animal feeding devices: the large plastic bottle used with some drench gun devices can be strapped to the farmer's back, however this bottle is reusable and so there is a chance of infection of the animal from an inadequately sanitised bottle. Furthermore these types of bottle are too bulky and heavy to transport easily. Flexible plastic bags to contain the colostrum in esophageal feeding devices have also been
10 documented, however not in combination with a "hands-free" method of transportation: at best these inventions incorporate a mechanism for hanging the colostrum bag onto a hook, which is inconvenient to do before the feeder is properly inserted into the esophagus as this then restricts the operator's range of movement.

15 **Summary of invention**

The present invention comprises a device for oral administration of a fluid source, preferably an administration to an individual in need thereof, and methods for use of said device.

20 In one embodiment of the invention, the device is used is used to administer colostrum to newborn calves, in order to generate higher levels of passive immunity in the calves than may be gained either from natural suckling, bottle feeding of colostrum or feeding of colostrum substitutes.

25 The fluid or liquid source according to the invention is preferably selected from the group consisting of milk, artificial milk substitutes, colostrum. Liquid source in the form of colostrum is particularly preferred. The colostrum can be obtained from a domestic animal, including a bovine species.

30 In one aspect, there is provided a portable device for administration of a fluid source to a target, said device comprising

- (i) a hollow, axially-elongated member comprising

- a) a distal end comprising a first opening, preferably in the form of a nozzle portion, and
- b) a proximal end comprising a second opening connected to

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(ii) a handle comprising

- a) a distal portion connecting the handle to said axially-elongated member, and
- b) a proximal portion connecting the handle to

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(iii) a flexible tube comprising

- a) a distal end comprising a first opening connected to the handle, and
- b) a proximal end comprising a second opening connected to

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(iv) a hollow adaptor capable of securing the connection of the flexible tube to a fluid source container, said adaptor comprising

- a) a distal end comprising a first opening capable of bringing the adaptor in contact with the fluid source, and
- b) a proximal end comprising a second opening capable of securing the attachment of the adaptor to the tubing,

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(v) said device further comprising a switch mechanism for regulating the flow of liquid through the axially-elongated member.

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The invention also pertains to a container comprising a single, flexible polymer sheet, said polymer sheet comprising a first wall portion, a second wall portion, and a base portion,

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wherein the first wall portion is permanently fixed to said second wall portion along a single first axis,

wherein said first wall portion is permanently fixed to a base portion along a single second axis,

wherein said second wall portion is detachably fixed to said first wall portion along a single third axis, and

wherein said second axis connects said first and third axes.

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In other aspects there is provided methods for using said device and/or said container, including a method for oral administration of a fluid or liquid source to an animal, said method comprising the steps of

- 10 i) providing a fluid or liquid source,
- ii) providing a device according to the invention,
- 15 iii) filling said container or container insert of the device with said fluid or liquid source, and
- iv) administering said fluid or liquid source to said animal, optionally by operating said switch mechanism.

20 It is preferred that the liquid source is selected from colostrum, aqueous solutions of nutrients or electrolytes, aqueous solutions of medicaments, and the like.

25 There is also provided a method for oral administration of colostrum to a bovine species, said method comprising the steps of

- i) providing a colostrum in liquid form,
- 30 ii) providing a device according to any of claims 33 to 40,
- iii) filling said container or container insert of the device with said colostrum, and
- 35 iv) administering said colostrum to said bovine species, optionally by operating said switch mechanism.

In yet another aspect there is provided a method for conferring passive immunity to a new-born domestic animal, said method comprising the steps of

- 5 i) providing a passive immunity source, such as immunoglobulins,
- ii) providing a device according to any of claims 33 to 40,
- iii) filling said container or container insert of the device with said
10 passive immunity source, and
- iv) administering said passive immunity source to said bovine species,
 optionally by operating said switch mechanism.

15 **Description of drawings.**

FIG. 1 is a side view of the axially-elongated member (10), the nozzle (20) and the handle (30) preferably comprising a switch (40).

20 FIG. 2 is a detailed side view of the handle, showing one preferred embodiment of the switch (40) and the connecting axially-elongated member (10) and the flexible tube (50).

FIG. 3 is a 3D view of the axially-elongated member (10), the handle (30), the flexible tube (50) and the adaptor (60)

25 FIG. 4 is a detailed 3D view of the adaptor, showing the locking pins (70) and the planar flanges (80)

FIG. 5 shows detailed diagrammatical representations of a side view and two end-on views of one preferred embodiment of the adaptor.

FIG. 6 shows detailed diagrammatical representations of two side views and two end-on views of an alternative preferred embodiment of the adaptor.

30 FIG. 7 is a detailed view of the nozzle portion of the axially-elongated member, showing the length of the nozzle (90), the inner diameter, i.e. the diameter of the hollow part of the nozzle (100) and the outer diameter (110) of parts of the axially-elongated member excluding the nozzle.

FIG. 8 is a 3D view of a set-up for cleaning the present invention: the adaptor preferably comprises a portion (120) capable of being connected to a water tap (130) via a hosepipe adaptor (140).

FIG. 9 is a 3D view of the empty container, with straps (150) enabling the container to be carried on the operator's back and an attachment site (160) for the elongated member and handle. The view also shows the holes (170) in the front of the container enabling the operator to easily view the amount of liquid in the container and also allowing easy bending of the container into the desired shape.

FIG. 10 is a top view of the container.

FIG. 11 is a back view of the container.

FIG. 12 is a side view of the container showing the attachment site (180) for the adaptor.

FIG. 13 is a front view of the container

FIG. 14 is a 3D view of the collapsible container, showing how it may be made from a flat sheet of material. The first (190), second (200) and third (210) axes are marked as are the holes for insertion of the carrying straps (220). The first wall (230), second wall (240) and base sections (250) are also labelled.

FIG. 15 is a 3D view of the container insert (260), which may be easily dispensed from a roll of container inserts (270). Each insert preferably has markings on it (280) indicating the level of fluid within the insert.

FIG. 16 is a 3D view of fluid (290) inside the open container insert, which is itself inside the container.

FIG. 17 is a 3D view of the adaptor (60) operably linked to the fluid source.

FIG. 18 is a 3D view of how the adaptor (60) may be securely attached using the locking pins (70) and the planar flanges (80)

FIG. 19 illustrates how the container may be carried by the operator on his/her back by using the straps.

FIG. 20 is a 3D view of how the elongated member and handle may be attached to the container for transport purposes using the attachment site.

FIG. 21 is a 3D view of the whole device.

Definitions

5 "some degree of flexibility" refers to the fact that the axially-elongated member can bend, under practical circumstances, more than 5 mm for every 10 cm length of the member. The flexible nature of the member is distributed evenly over the entire length of the member.

10 "essentially inflexible" refers to the fact that that the axially-elongated member can bend, under practical circumstances, less than 5 mm for every 10 cm length of the member.

15 "flexible tube" refers to a tube with a high degree of flexibility, i.e. an ability to attain multiple forms such as e.g. coils and other shapes not obtainable by objects having merely some degree of flexibility.

"nozzle" refers to a mouth piece of the axially-elongated member. The nozzle constitutes the distal opening of the member and is preferably of a rounded shape. The nozzle can have more than one opening.

20 "fluid" describes both fluids and liquids, such as colostrum, water, foods of a fluid or liquid nature and pharmaceuticals provided as fluids or liquids.

25 "newborn" refers to an animal less than 5 days old, and preferably it relates to an animal within 48 hours of its birth.

"passive immunity" refers to immunity conferred on a subject by transferring immunoglobulins to the subject from a source other than the subject.

30 Detailed description of the invention

Axially elongated member

A feature of the present invention is a hollow, axially-elongated member which comprises a distal end comprising a first opening preferably in the form of a nozzle portion, and a proximal end comprising a second opening. In one preferred
35 embodiment of the invention, said hollow axially-elongated member is of a diameter

allowing insertion of the axially-elongated member into the esophagus of an individual, such as domestic animal, for example a ruminant, such as a member of a bovine species, for example a cow, such as a calf, for example a calf within e.g. 24 hours of birth.

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Preferred bovine species are selected from the group consisting of Jersey, Red Danish Breed, Red and White Danish Breed, and Holstein.

10

The outer diameter of the axially-elongated member, either including or not including the nozzle portion, is preferably less than 20 mm, such as less than 19 mm, for example less than 18 mm, such as less than 17 mm, for example less than 16 mm, such as less than 15 mm, for example less than 14 mm, for example less than 13 mm, such as less than 12 mm, for example less than 11 mm, such as less than 10 mm, for example less than 9 mm, such as 8 mm.

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The diameter of the hollow section (inner diameter) of the elongated member is capable of allowing the flow of a fluid through the elongated member from the opening in the proximal end and out of the opening in the distal end, said diameter a preferred embodiments being less than 18 mm, such as less than 17 mm, for example less than 16 mm, such as less than 15 mm, for example less than 14 mm, for example less than 13 mm, such as less than 12 mm, for example less than 11 mm, such as less than 10 mm, for example less than 9 mm, such as 8 mm, for example less than 7 mm, such as less than 6 mm.

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In one preferred embodiment of the invention, the diameter of the nozzle portion preferably prevents the axially-elongated member from being inserted into the trachea of a domestic animal, the diameter of tracheas of all domestic animals being easily obtainable in the prior art by those skilled in the art.

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In a preferred embodiment, the domestic animal is a newborn calf, and the diameter of the nozzle at any point along the nozzle is a maximum of about 2 cm. In another preferred embodiment of the invention, the diameter of the nozzle may also be of sufficient size in at least one section of the nozzle to allow the operator of the current invention to use his hand on the outside of an animal's neck to feel the location of the nozzle within the animal, thus enabling the operator to gain an idea of

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the location of the nozzle within the animal and allowing the operator to more easily insert the nozzle into the esophagus of said animal.

5 In preferred embodiments of the present invention, the elongated member is preferably manufactured from one or more materials such as, but not restricted to, a plastic such as polyethylene, polypropylene, PVC, and similar polymers suitable for the purpose of the invention.

10 According to one embodiment of the present invention, the nozzle of said elongated member is not of uniform diameter but is of a shape allowing ease of insertion into an animal's esophagus. In this case, the animal is preferably a domestic animal, more preferably a ruminant, even more preferably a member of a bovine species, more preferably a cow, more preferably a calf, more preferably a calf within 24 hours of birth. One or more parts of the shape of the nozzle are preferably of larger
15 diameter than the remaining sections of the axially-elongated member. The shape is preferably tear-shaped and/or tapering; an example of one preferred shape is illustrated in FIG. 7.

20 In particularly preferred embodiments, the present invention provides a device, wherein the axially-elongated member comprising the nozzle portion is capable of being inserted into the esophagus of a domestic animal, and wherein the nozzle portion preferably prevents the axially-elongated member from being inserted into the trachea of the domestic animal. For this purpose, the nozzle is preferably rounded in shape and has an outer diameter larger than the outer diameter of the
25 rest of the axially-elongated member.

The axially-elongated member can have at least some degree of flexibility. However, the axially elongated member can also be rigid and essentially inflexible so as to prevent the animal from breaking the member. A hardend polymer is suitable for
30 such embodiments, including e.g. a thermoplastic polymer and polymers such as polypropylene, polyethylene, polyvinylchloride, and the like. Such polymer materials can be subjected to e.g. hot or boiling water for cleaning purposes.

35 Preferably, the length of the axially elongated member from the tip of the nozzle portion to the distal portion of the handle is preferably from 20 to 40 cm, such as

from 25 to 35 cm, for example from 30 cm to 34 cm, such as about 32 cm, and the inner diameter of the axially-elongated member excluding the nozzle portion is preferably from 0.5 cm to 2 cm, such as about 0.8 cm, for example about 1.0 cm, such as about 1.2 cm, for example 1.5 cm, while the outer diameter of the axially-
 5 elongated member excluding the nozzle portion is from 0.2 cm to about 1 cm larger than the inner diameter of the rest of the axially-elongated member.

Handle

A feature of the present invention is a handle preferably comprising a manually
 10 operated switch mechanism, a distal portion connecting the handle to said axially-elongated member, and a proximal portion. The handle is preferably of a length and diameter allowing it to be held and easily operated by a human hand; the length of the handle being preferably 5-30 cm long, more preferably less than 25 cm long, more preferably less than 20 cm long, such as 19, 18, 17, 16, 15, 14, 13, 12, 11, 10,
 15 9, 8, or 7 cm long.

Preferred dimensions of the handle are illustrated in FIG. 2. In preferred
 embodiments of the present invention, the handle, including or not including the
 20 switch, is preferably manufactured from one or more materials such as, but not restricted to, plastics such as polyethylene or the like, metal, rubber and/or wood.

The switch mechanism preferably built into the handle is capable of altering the rate
 of flow of the fluid from the elongated member to the flexible tube. In one preferred
 25 embodiment of the invention, the switch mechanism allows two or more differing rates of flow of liquid from the elongated member to the flexible tube.

Preferably, one or more audible sounds are used to indicate the rate of flow chosen
 by the operator, said sounds being generated e.g. by a first switch plate contacting a
 30 second plate comprising a plurality of apertures, wherein the first switch plate can rest in said apertures and thereby allow a fixed flow of fluid through said axially-elongated member.

In preferred embodiments of the present invention, the switch is preferably
 manufactured from one or more materials such as, but not restricted to, plastic such
 35 as polyethylene, polypropylene, and the like.

It is much preferred that the switch mechanism for regulating the flow of fluid source through the axially-elongated member is comprised in the handle as this makes the device easier to operate. However, the switch mechanism can also be placed in contact with the flexible tube. The switch mechanism is preferably manually operated, but it can also be an electronic switch operated by an electronic control device preferably forming part of the handle.

As one or more audible sounds generated by the switch indicate the rate of flow of liquid, the device can be operated in dark or poorly lit places such as animal houses and stables.

Although it is preferred that the handle is hollow, the handle can also be detachably connected to the axially-elongated member. In one embodiment, the device does not comprise a handle, but as an alternative merely a tube adaptor for connecting the flexible tube and the axially elongated member.

Flexible tube

A feature of the present invention is a flexible tube comprising a distal end comprising a first opening connected to the handle, and a proximal end comprising a second opening. The diameter of the hollow section of the tube is capable of allowing the flow of a fluid through the tube from the opening in the proximal end and out of the opening in the distal end, said diameter in a preferred embodiment is less than 2 cm.

In preferred embodiments of the present invention, the flexible tube is manufactured from one or more materials such as, but not restricted to, flexible plastics such as polyethylene and polypropylene. In one preferred embodiment, the axially-elongated member is less flexible than the flexible tube.

Adaptor

A feature of the present invention is a hollow adaptor capable of connecting the flexible tube to a fluid source, said adaptor comprising a distal end comprising a first opening capable of bringing the adaptor in contact with the fluid source, and a proximal end for securing the attachment of the adaptor to the tubing. In one

preferred embodiment of the present invention, at least part of the adaptor comprises a tapering part. Preferably the end of the adaptor is pointed.

5 It is much preferred that the adaptor further comprises a locking portion preferably comprising a plurality of locking pins, such as two locking pins, or more than two locking pins, for securing the attachment of the adaptor to said fluid source container. The adaptor can also comprise two or more oppositely located planar flanges for rotating the adaptor once it has made contact with the fluid source container.

10 In order to ensure a proper cleaning of the assembled device after use, the adaptor can further comprise a portion for detachably connecting the adaptor to a cleaning device. The cleaning device can be a water tap optionally fitted with a hosepipe adaptor capable of detachably connecting the water tap to the adaptor of the device.
15 In this way it is possible to flush through the system with water or aqueous liquid optionally comprising a cleaning agent.

In preferred embodiments of the present invention, the adaptor is preferably manufactured from one or more materials such as, but not restricted to, plastics
20 such as but not restricted to, polyethylene, polypropylene and/or metals such as, but not restricted to, stainless steel.

Container

25 Another feature of the present invention is a container capable of holding a volume of fluid or liquid for administration of said fluid or liquid to an animal. In a preferred embodiment of the invention, said container is portable and preferably capable of being transported by a single operator of the device.

30 To allow ease of transport, the container preferably comprises one or more carrying straps. In a preferred embodiment, these carrying straps enable the container to be transported on the back of a operator. In preferred embodiments of the present invention, the straps are preferably manufactured from one or more materials such as, but not restricted to, rubber, leather and/or artificial materials.

In one preferred embodiment of the invention, the container is collapsible, allowing ease of packaging, transport and storage of the container; even more preferably the container comprises a single sheet of material, preferably a polymer material, capable of folding into a container.

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The sheet preferably comprises a first wall portion, a second wall portion, and a base portion,

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wherein the first wall portion is permanently fixed to said second wall portion along a single first axis,

wherein said first wall portion is permanently fixed to a base portion along a single second axis,

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wherein said second wall portion is detachably fixed to said first wall portion along a single third axis, and

wherein said second axis connects said first and third axes.

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This is illustrated in Fig. 14.

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In a preferred embodiment of the present invention, the container comprises an cut in or a hook for securing the elongated member when the device is not in use. The cut in is preferably located in the top part of the second wall portion. This is illustrated in Fig. 20.

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In preferred embodiments of the present invention, the container is preferably manufactured from one or more materials such as, but not restricted to, plastics, preferably polyethylene or polypropylene, and/or metals, preferably but not restricted to stainless steel.

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The shape of the container may be any design allowing efficient transport of the fluid, for example the container may be cylindrical or in the shape of a cuboid. One preferred shape of the container is illustrated in FIGS. 9-14.

In one preferred embodiment of the invention, the fluid to be administered to the individual is contained within a container insert in the form of a polymer bag, which is preferably disposable, allowing hygienic transport of the fluid. The bag is preferably marked clearly with printed markers, allowing the user to estimate how much fluid is contained within the bag, for example these markers in one embodiment mark the level reached by fluid in the bag in intervals of 1 litre, for example up to 10 litres, more preferably less than 9 litres, for example 8 litres, such as 7 litres, for example 6 litres, such as 5 litres, for example in intervals of 1,2,3 and 4 litres of fluid, or alternatively in intervals of smaller than a litre, for example the markers may read 0.5, 1, 1.5, 2, 2.5., 3, 3.5 and 4 litres.

In one preferred embodiment of the invention, the container insert is capable of containing less than 10 litres of fluid, such as less than 9 litres of fluid, for example less than 8 litres of fluid, such as less than 7 litres of fluid, for example less than 6 litres of fluid, such as less than 5 litres of fluid, for example less than 4 litres of fluid, such as less than 3 litres of fluid, for example less than 2 litres of fluid. In preferred embodiments of the present invention, the container insert is preferably manufactured from one or more materials such as, but not restricted to, plastics such as polyethylene and/or PVC, laminated paper or materials known to those skilled in the art to have similar properties.

Individuals in need of administration of fluid from this device are preferably domestic animals, such as ruminants, preferably bovine species, more preferably species of cow, more preferably calves, more preferably newborn calves, more preferably newborn calves within 24 hours of birth.

Fluids which may be administered include, but are not restricted to, water, fluid or liquid foods, colostrum, artificial food supplements, as well as fluid or liquid medicaments.

In one preferred embodiment, the invention is used to administer colostrum to newborn calves, in order to generate higher levels of passive immunity in the calves than may be gained either from natural suckling, bottle feeding of colostrum or feeding of colostrum substitutes.

Claims

1. A portable device for administration of a fluid source to a target, said device comprising
 - i) a hollow, axially-elongated member comprising
 - a) a distal end comprising a first opening, preferably in the form of a nozzle portion, and
 - b) a proximal end comprising a second opening connected to
 - ii) a handle comprising
 - a) a distal portion connecting the handle to said axially-elongated member, and
 - b) a proximal portion connecting the handle to
 - iii) a flexible tube comprising
 - a) a distal end comprising a first opening connected to the handle, and
 - b) a proximal end comprising a second opening connected to
 - iv) a hollow adaptor capable of securing the connection of the flexible tube to a fluid source container, said adaptor comprising
 - a) a distal end comprising a first opening capable of bringing the adaptor in contact with the fluid source, and
 - b) a proximal end comprising a second opening capable of securing the attachment of the adaptor to the tubing,
 - v) said device further comprising a switch mechanism for regulating the flow of liquid through the axially-elongated member.
2. The device according to claim 1, wherein the fluid source comprises or consists of a liquid source.
3. The device according to claim 2, wherein the liquid source is selected from the group consisting of milk, artificial milk substitutes, colostrum.

4. The device according to claim 3, wherein the liquid source is colostrum.
5. The device according to claim 4, wherein the colostrum is obtained from a domestic animal, including a bovine species.
6. The device according to claim 5, wherein the target is a domestic animal.
7. The device according to claim 6, wherein the domestic animal is a ruminant.
8. The device according to claim 7, wherein the ruminant is a bovine species.
9. The device according to claim 8, wherein the bovine species is selected from the group consisting of Jersey, Red Danish Breed, Red and White Danish Breed, Black and White Danish Breed, and Holstein.
10. The device according to claim 8, wherein the bovine species is a newborn bovine species less than five days old.
11. The device according to claim 1, wherein the axially-elongated member comprising the nozzle portion is capable of being inserted into the esophagus of a domestic animal.
12. The device according to claim 11, wherein the nozzle portion preferably prevents the axially-elongated member from being inserted into the trachea of the domestic animal.
13. The device according to any of claims 11 and 12, wherein the nozzle is rounded in shape and has an outer diameter larger than the outer diameter of the rest of the axially-elongated member.
14. The device according to any of claims 1 to 13, wherein the axially-elongated member has retained at least some degree of flexibility.

15. The device according to any of claims 1 to 13; wherein the axially-elongated member is essentially inflexible.
- 5 16. The device according to claim 13, wherein the axially-elongated member comprises or consists of a polymer.
17. The device according to claim 16, wherein the polymer is a thermoplastic polymer.
- 10 18. The device according to claim 16, wherein the polymer is polypropylene or polyethylene.
- 15 19. The device according to any of claims 1 to 18, wherein the length of the axially elongated member from the tip of the nozzle portion to the distal portion of the handle is from 30 cm to 34 cm, such as about 32 cm.
- 20 20. The device according to any of claims 1 to 19, wherein the inner diameter of the axially-elongated member excluding the nozzle portion is from 0.5 cm to 2 cm, such as about 0.8 cm, for example about 1.0 cm, such as about 1.2 cm, for example 1.5 cm.
- 25 21. The device according to claim 20, wherein the outer diameter of the axially-elongated member excluding the nozzle portion is from 0.2 cm to about 1 cm larger than the inner diameter of the rest of the axially-elongated member.
- 30 22. The device according to claim 1, wherein the switch mechanism for regulating the flow of fluid source through the axially-elongated member is comprised in the handle.
- 35 23. The device according to claim 22, wherein the switch mechanism is manually operated.
24. The device according to claim 23, wherein one or more audible sounds generated by the switch indicate the rate of flow of liquid.

25. The device according to any of claims 1 to 24, wherein the handle is hollow.
26. The device according to any of claims 1 to 25, wherein the handle is detachably connected to the axially-elongated member.
- 5 27. The device according to any of claims 1 to 26 wherein the adaptor comprises a tapering end.
28. The device according to claim 27, wherein the tapering end is pointed.
- 10 29. The device according to any of claims 27 and 28, wherein said adaptor further comprises a plurality of locking pins for securing the attachment of the adaptor to said fluid source container.
- 15 30. The device according to any of claims 27 and 28, wherein said adaptor further comprises two oppositely located planar flanges for rotating the adaptor once it has made contact with the fluid source container.
- 20 31. The device according to any of claims 27 and 28, wherein said adaptor further comprises a portion for detachably connecting the adaptor to a cleaning device.
- 25 32. The device according to claim 31, wherein said cleaning device is a water tap optionally fitted with a hosepipe adaptor capable of detachably connecting the water tap to the adaptor of the device.
33. The device according to any of claims 1 to 32 further comprising a liquid source container capable of being operably linked to the adaptor.
- 30 34. The device according to claim 33, wherein said container is capable of being unfolded into an essentially planar sheet when not in use.
- 35 35. The device according to claim 33, wherein the container comprises an attachment site for the adaptor of the device.

36. The device according to claim 33, wherein the container further comprises one or more straps for allowing easy transport of the device by the operator of the device.

5 37. The device according to claim 36, wherein the straps enable the operator to carry the container on his back.

38. The device according to any of claims 33 to 37, wherein the container further comprises a container insert, preferably in the form of a flexible polymer bag.

10 39. The device according to claim 38, wherein the container insert is disposable.

40. The device according to any of claims 33 to 39, wherein the container comprises a single polymer sheet capable of folding into a container, said polymer sheet comprising

a first wall portion, a second wall portion, and a base portion

20 wherein the first wall portion is permanently fixed to said second wall portion along a single first axis,

wherein said first wall portion is permanently fixed to a base portion along a single second axis,

25 wherein said second wall portion is detachably fixed to said first wall portion along a single third axis,

and wherein said second axis connects said first and third axes.

30 41. A container comprising a single, flexible polymer sheet, said polymer sheet comprising a first wall portion, a second wall portion, and a base portion,

wherein the first wall portion is permanently fixed to said second wall portion along a single first axis,

35

wherein said first wall portion is permanently fixed to a base portion along a single second axis,

wherein said second wall portion is detachably fixed to said first wall portion along a single third axis, and

wherein said second axis connects said first and third axes.

42. The container according to claim 41, wherein said container is portable.
43. The container according to any of claims 41 and 42, wherein said container comprises an attachment site capable of securing the attachment of the container to the adaptor of the device according to any of claims 1 to 37.
44. The container according to any of claims 41 to 43, wherein said container is capable of being unfolded into an essentially planar sheet when not in use.
45. The container according to any of claims 41 to 43, wherein the container further comprises one or more straps for allowing easy transport.
46. The container according to claim 45, wherein the straps enable the operator to carry the container on his back.
47. The container according to any of claims 41 to 46, wherein the container further comprises a container insert, preferably in the form of a flexible polymer bag.
48. The container according to claim 47, wherein the container insert is disposable.
49. A method for oral administration of a fluid or liquid source to an animal, said method comprising the steps of
- i) providing a fluid or liquid source,

- ii) providing a device according to any of claims 33 to 40,
- iii) filling said container or container insert of the device with said fluid or liquid source, and
- iv) administering said fluid or liquid source to said animal, optionally by operating said switch mechanism.

50. The method of claim 49, wherein said liquid source is selected from colostrum, aqueous solutions of nutrients or electrolytes, aqueous solutions of medicaments, and the like.

51. A method for oral administration of administration of colostrum to a bovine species, said method comprising the steps of

- i) providing a colostrum in liquid form,
- ii) providing a device according to any of claims 33 to 40,
- iii) filling said container or container insert of the device with said colostrum, and
- iv) administering said colostrum to said bovine species, optionally by operating said switch mechanism.

52. A method for conferring passive immunity to a new-born domestic animal, said method comprising the steps of

- i) providing a passive immunity source, such as immunoglobulins,
- ii) providing a device according to any of claims 33 to 40,
- iii) filling said container or container insert of the device with said passive immunity source, and

- iv) administering said passive immunity source to said bovine species, optionally by operating said switch mechanism.

5 53. The method of any of claims 49 to 52, wherein the size of the nozzle allows the operator of the device to indicate the position of the nozzle in the esophagus by pressing said nozzle portion against the wall of the esophagus under practical circumstances.

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Abstract

PVS

5 The present invention comprises a device for oral administration of a fluid source,
preferably an administration to an individual in need thereof, and methods for use of
said device. In one embodiment of the invention, the device is used is used to
administer colostrum to newborn calves, in order to generate higher levels of
passive immunity in the calves than may be gained either from natural suckling,
bottle feeding of colostrum or feeding of colostrum substitutes. The fluid or liquid
source according to the invention is preferably selected from the group consisting of
10 milk, artificial milk substitutes, colostrum. Liquid source in the form of colostrum is
particularly preferred. The colostrum can be obtained from a domestic animal,
including a bovine species.

Mål sonde

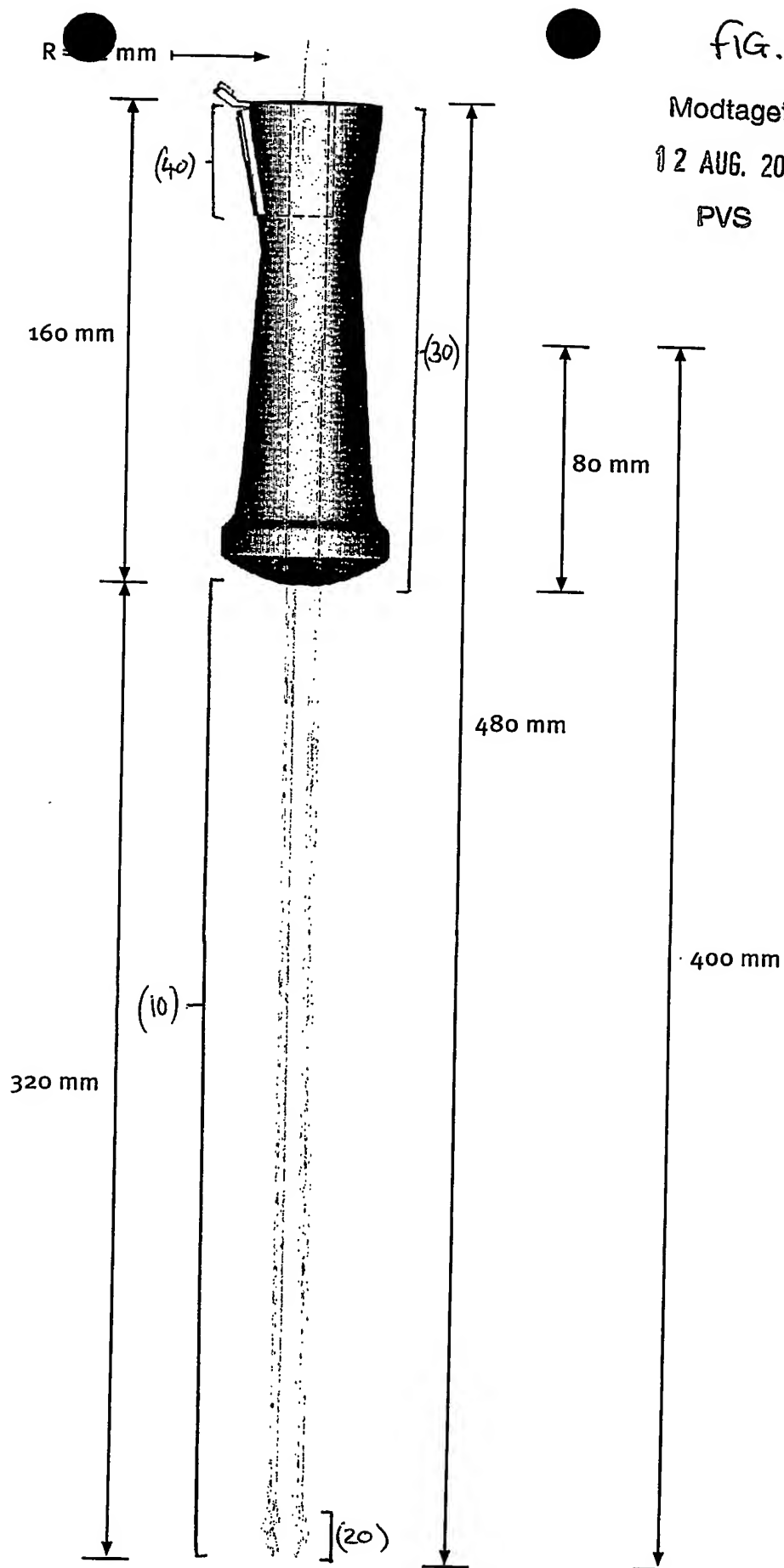
R = 2 mm

FIG. 1

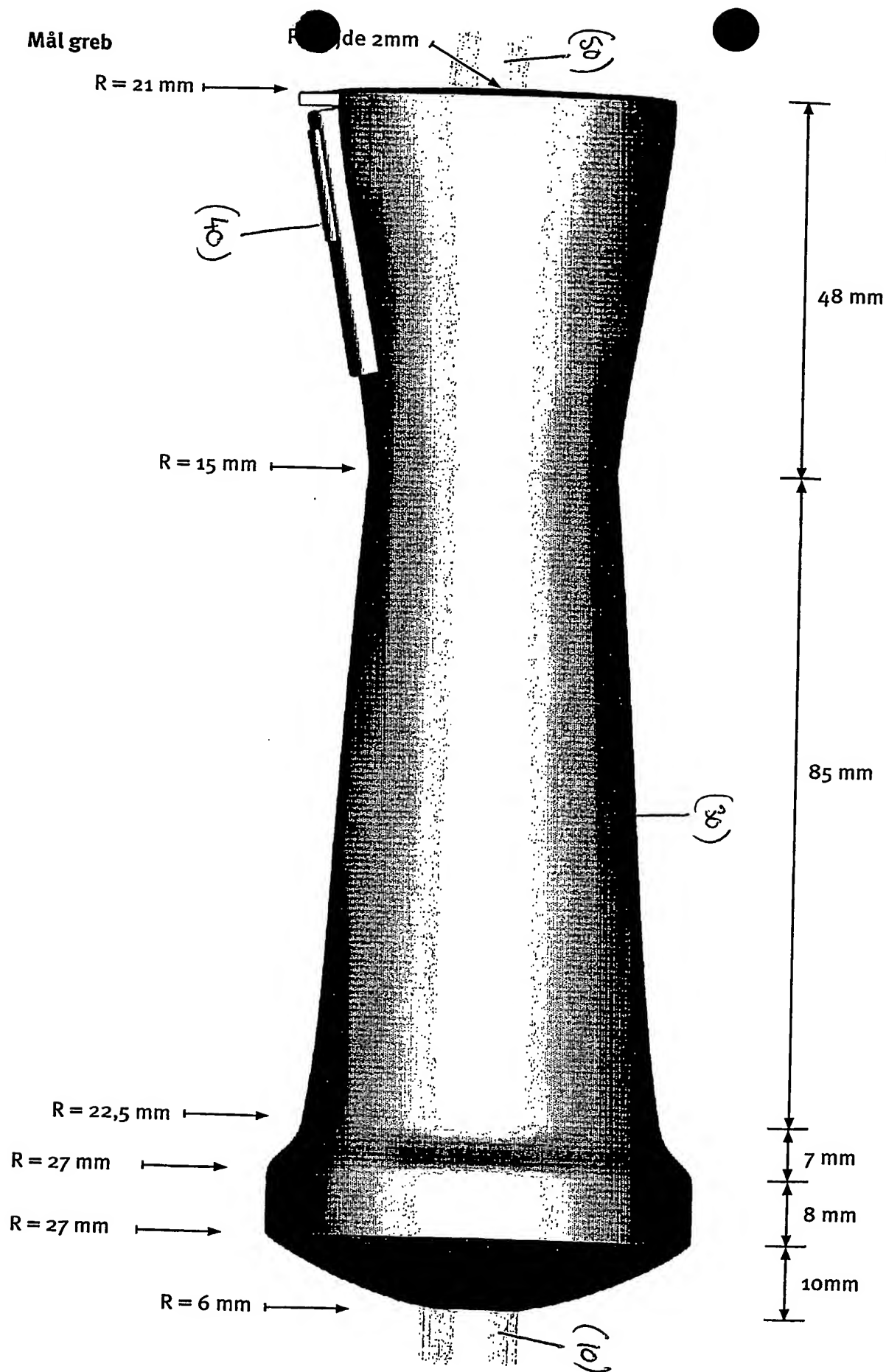
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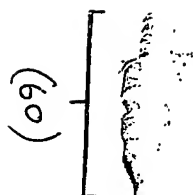
Best Available Copy

Sondedele - Løsdeler

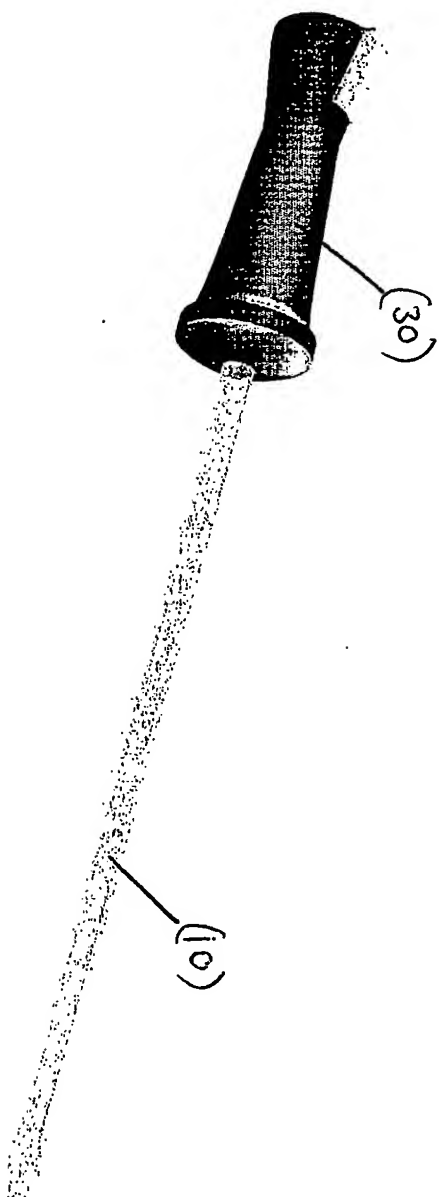


FIG. 3

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(50)



Spike, slange, greb, rør med endelut leveres samlet.
Delene skiftes med 3-6 mrd. mellemrum

PA 2000 01200

Sondedele - Spike



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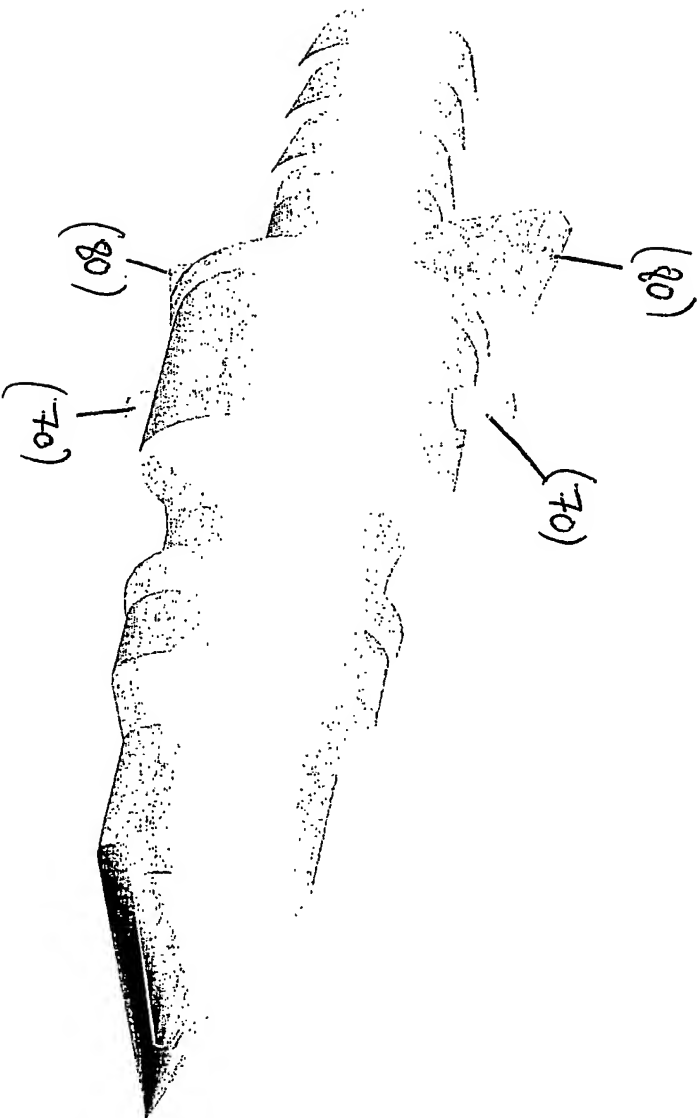


FIG. 4

Spiken gennemfører posen og er selvåbende.
Spiken passer i universal hevestangekopling og kan derfor gennemsules.

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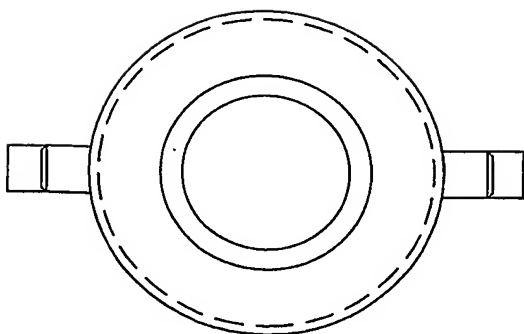
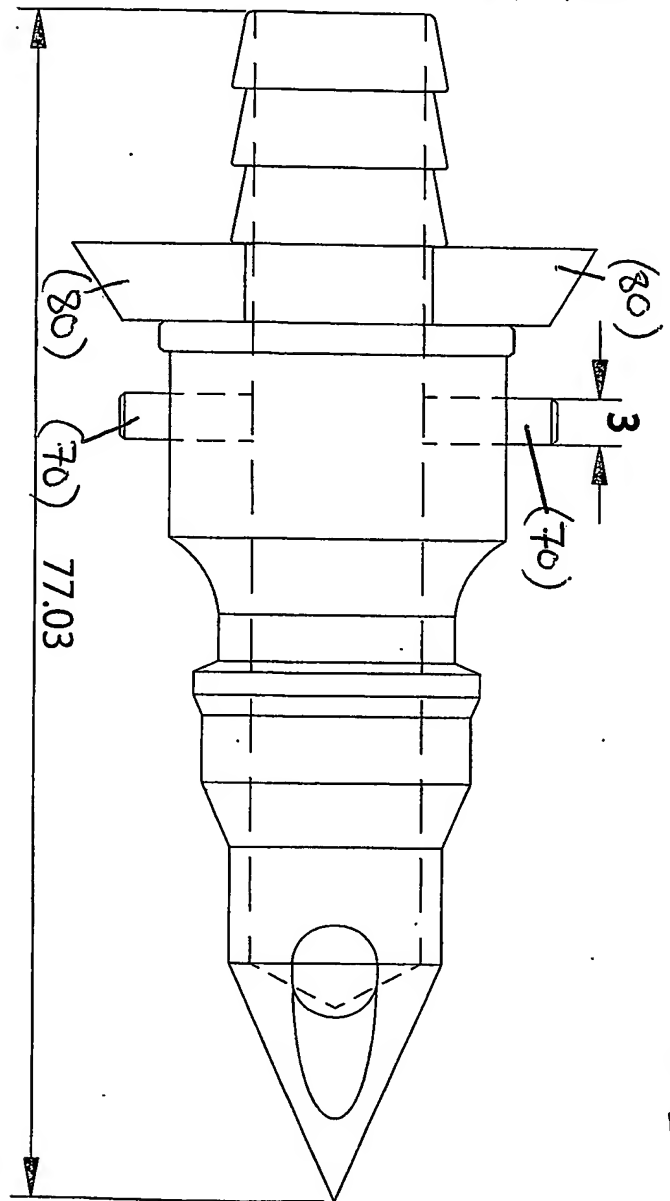
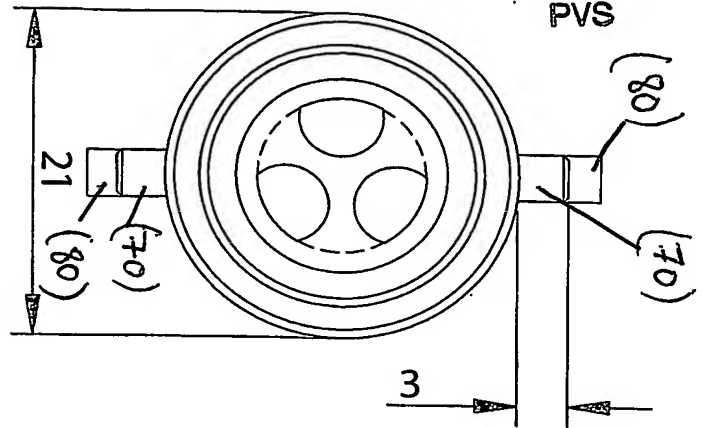
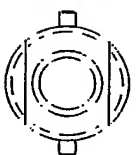
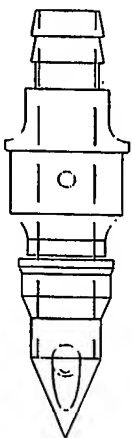
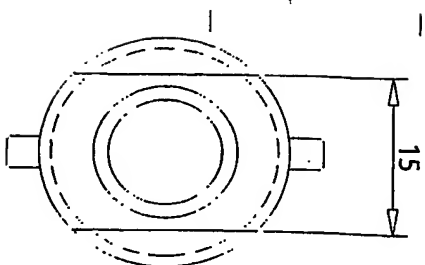
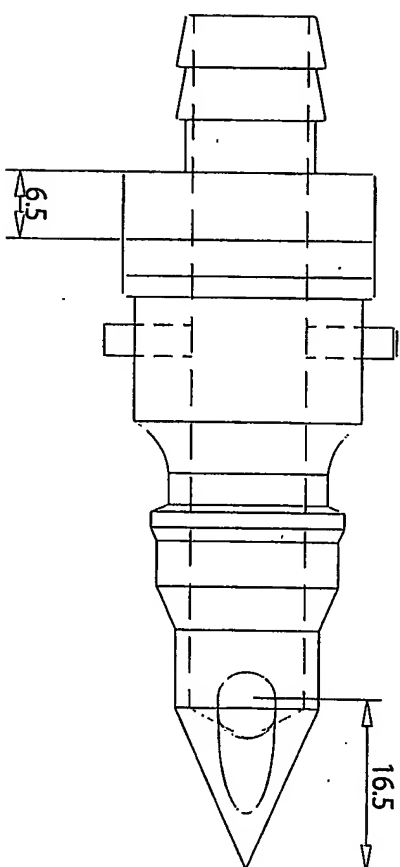
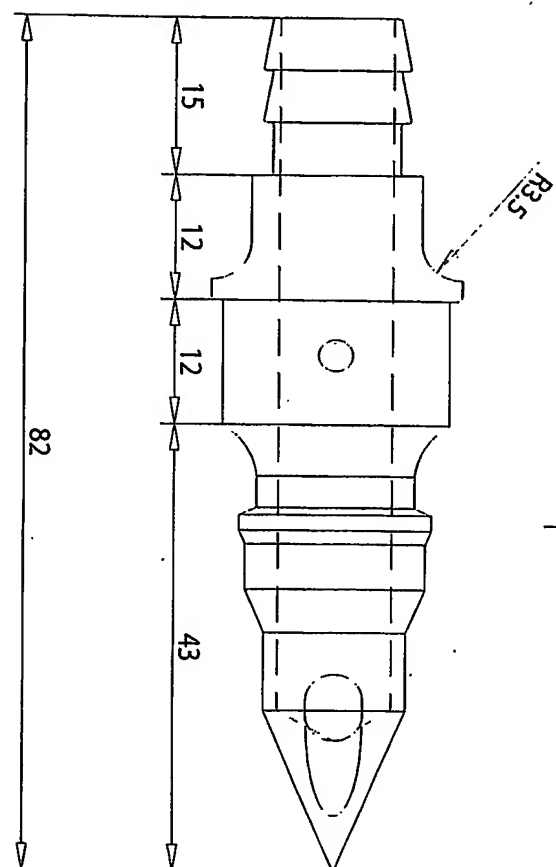
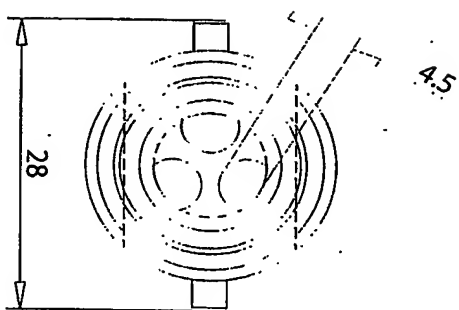


Fig. 5

FIG. 6

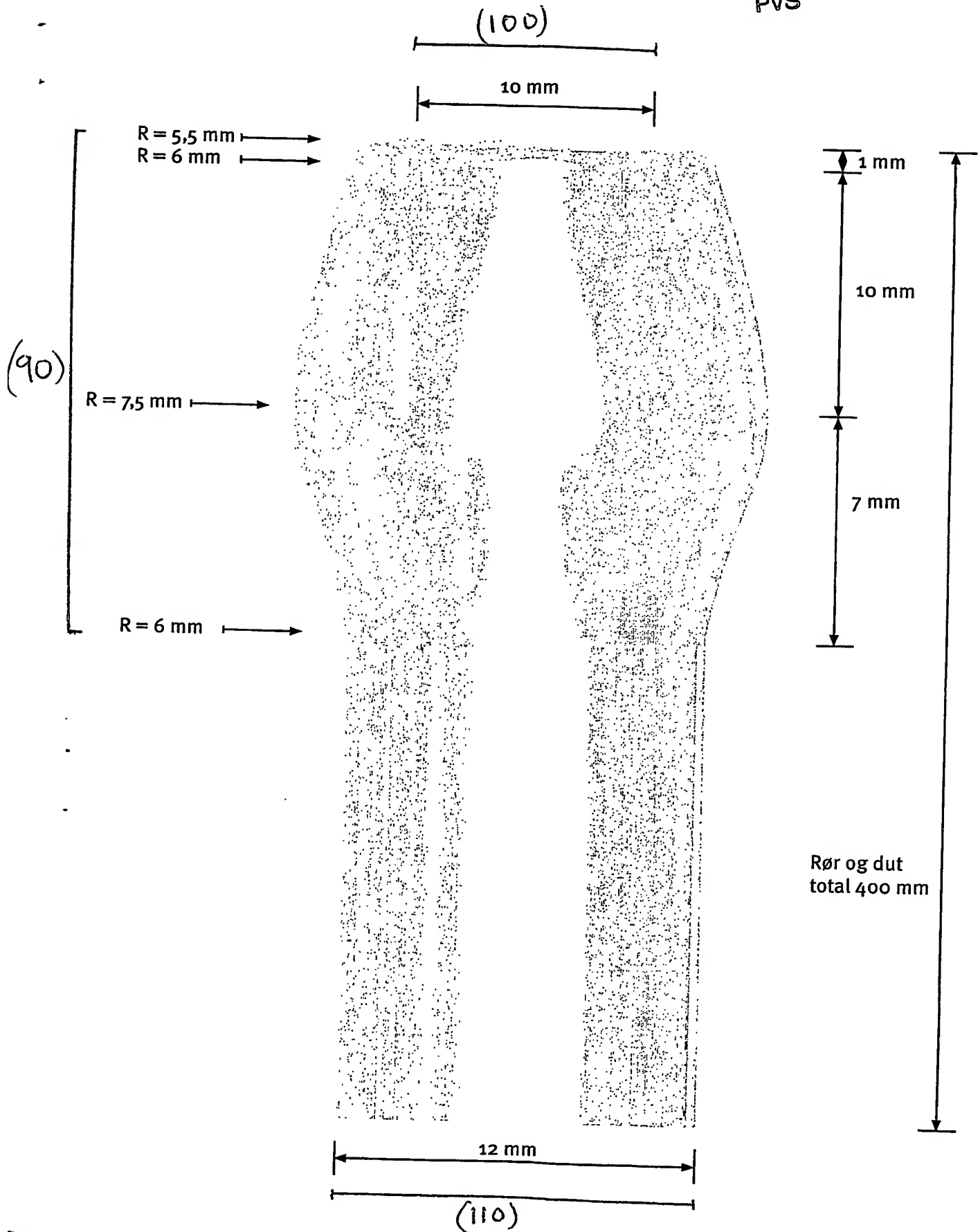


Mål spids

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FIG. 7.

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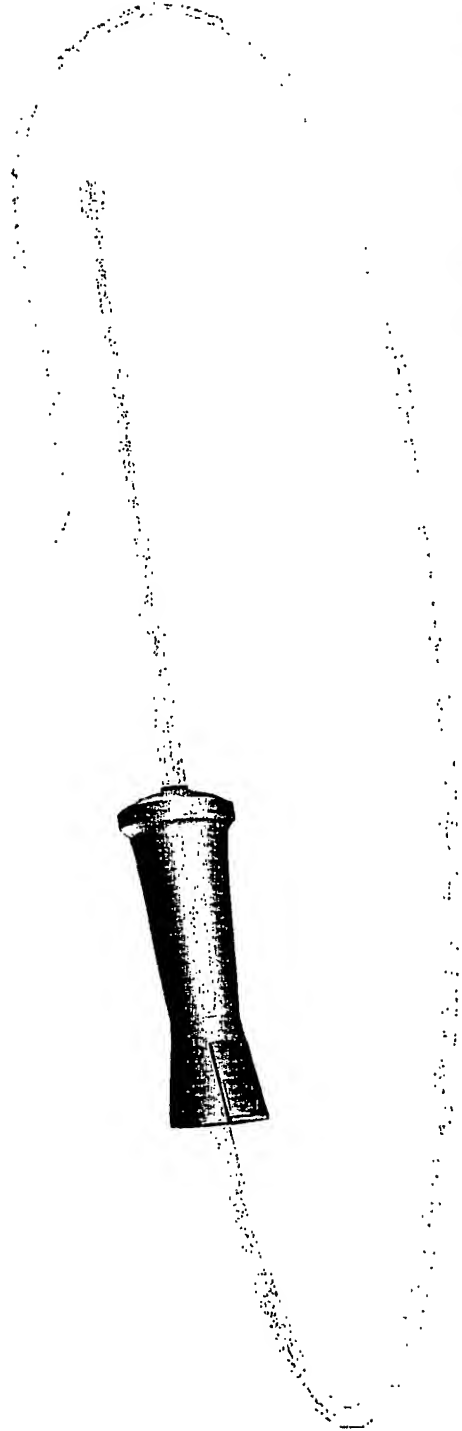
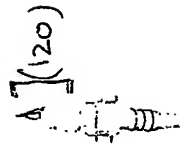
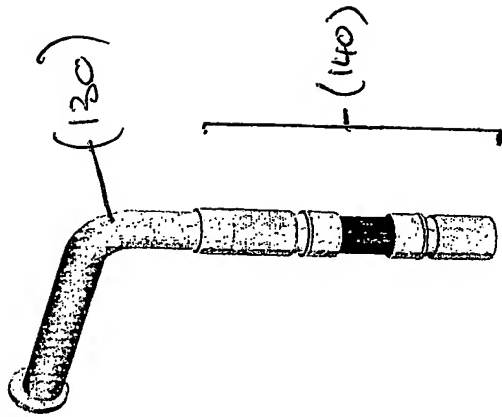


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FIG. 8



Brugsanvisning - Rengøring



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Spiken tilsluttes en standard universal haveslange kopling og spules igennem. Posen smides ud.

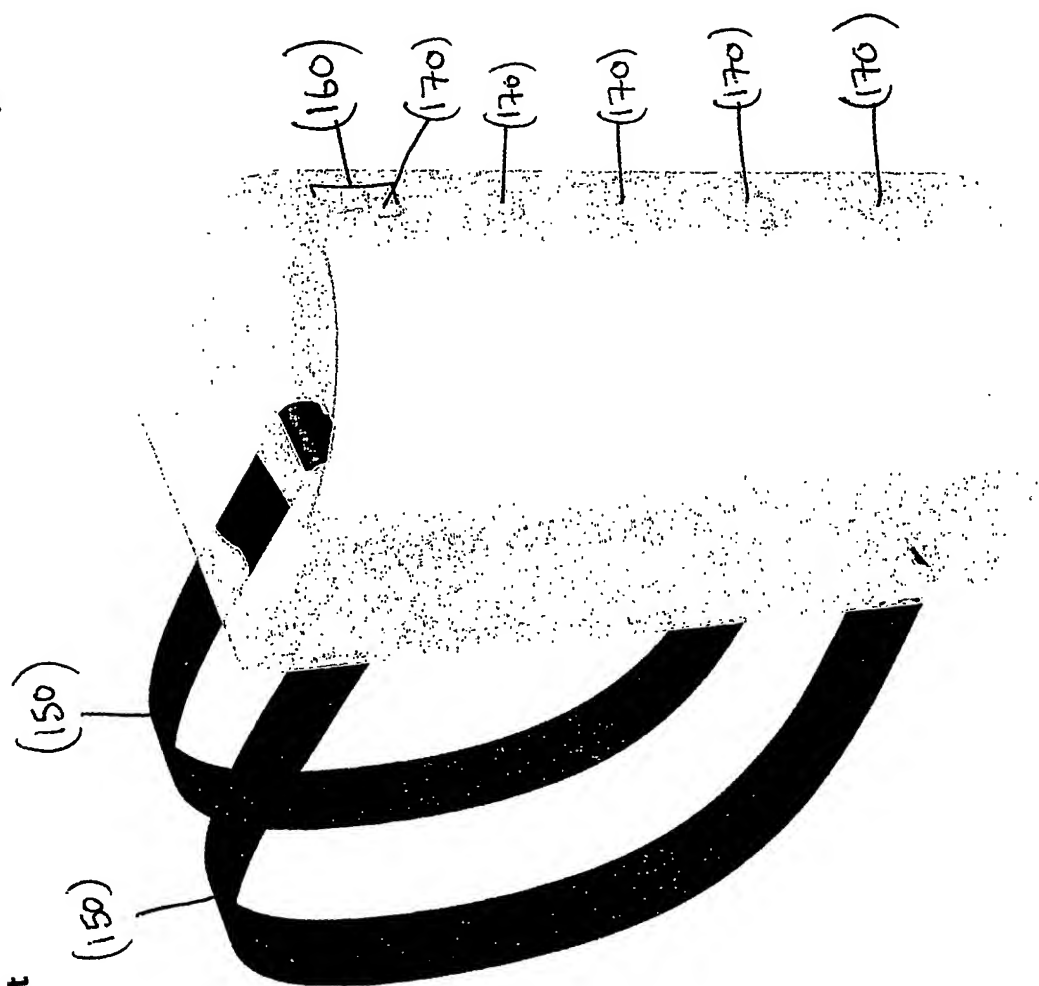
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side [4]

Sondedele - Beholder samlet

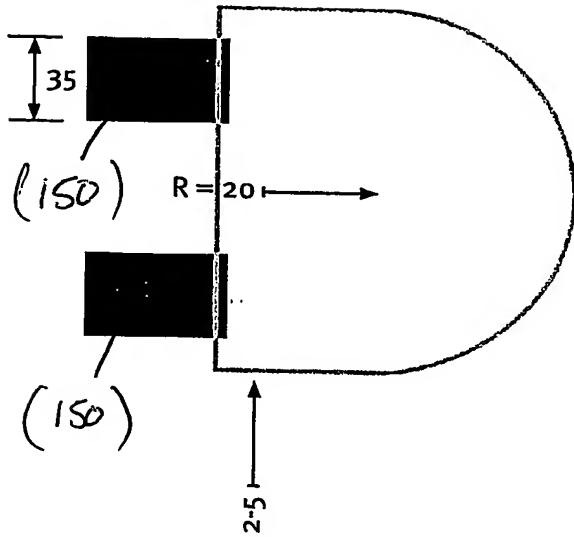
FIG. 9.



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Mål beholder mm

FIG. 10



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100

FIG. 11

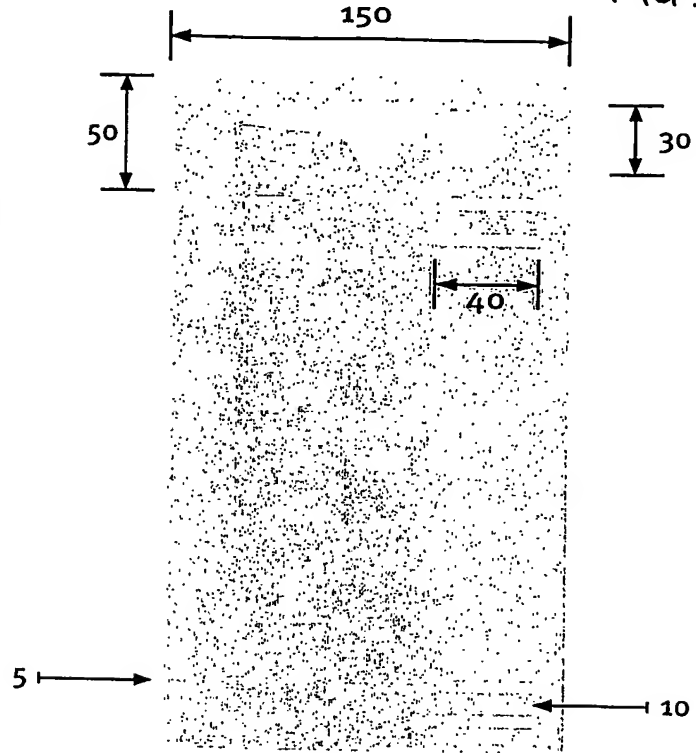


FIG. 12

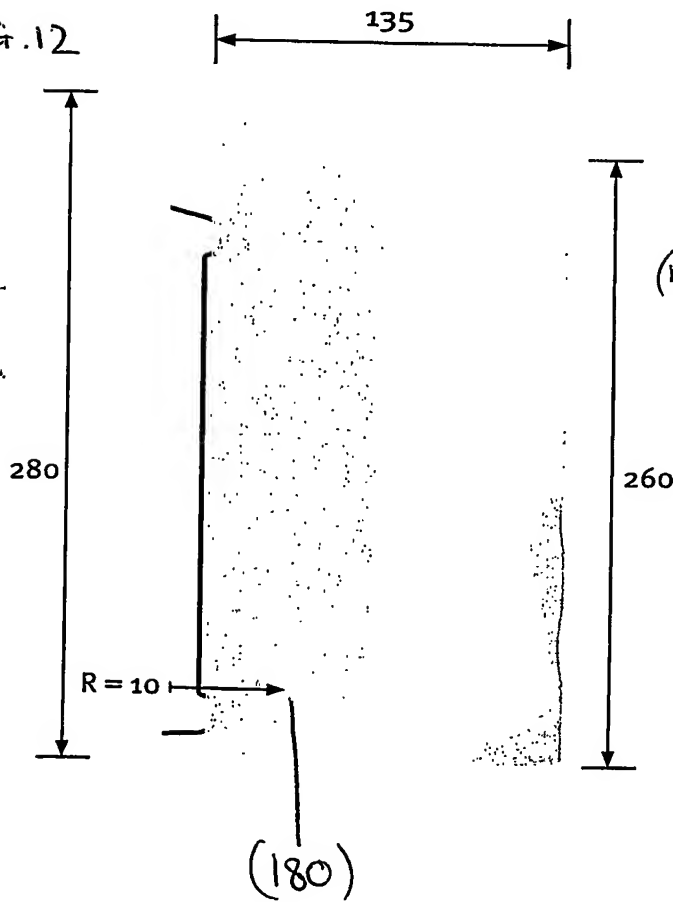
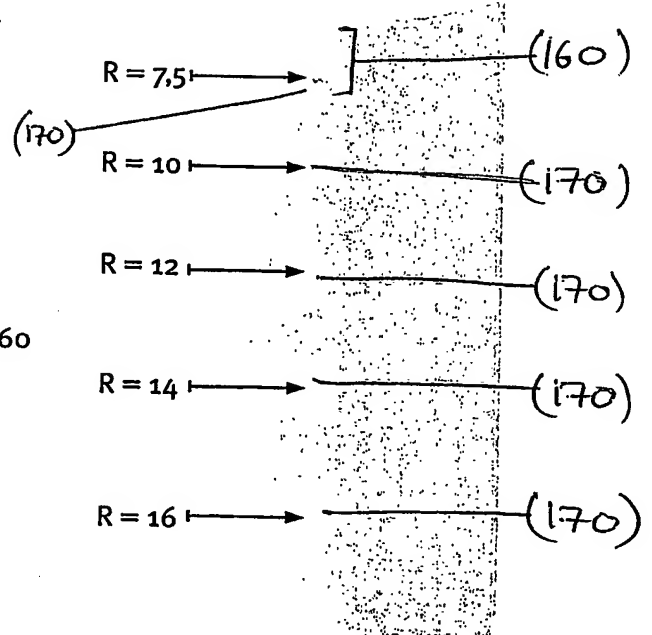


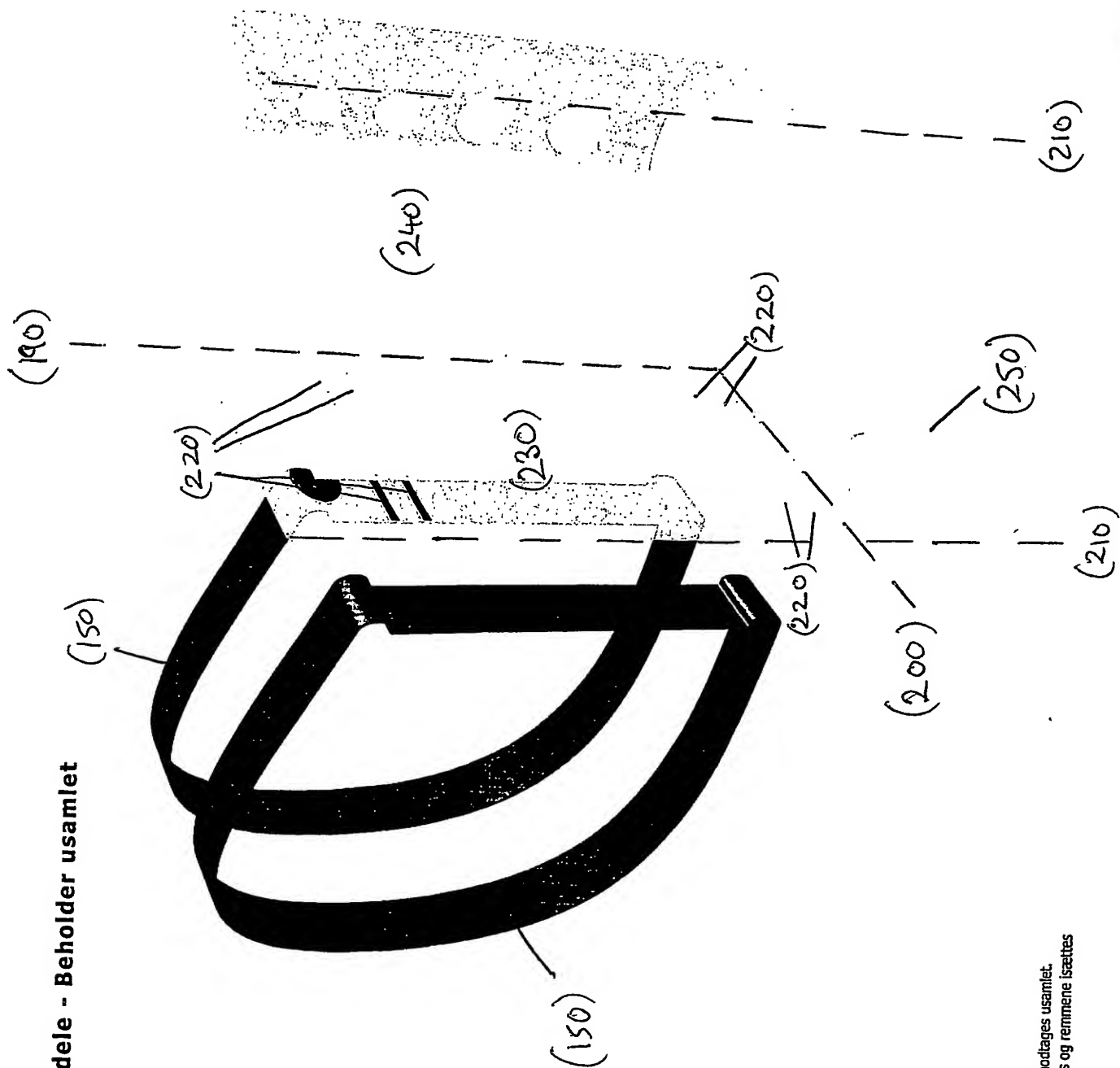
FIG. 13



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Sondedele - Beholder usamløt

FIG. 14.



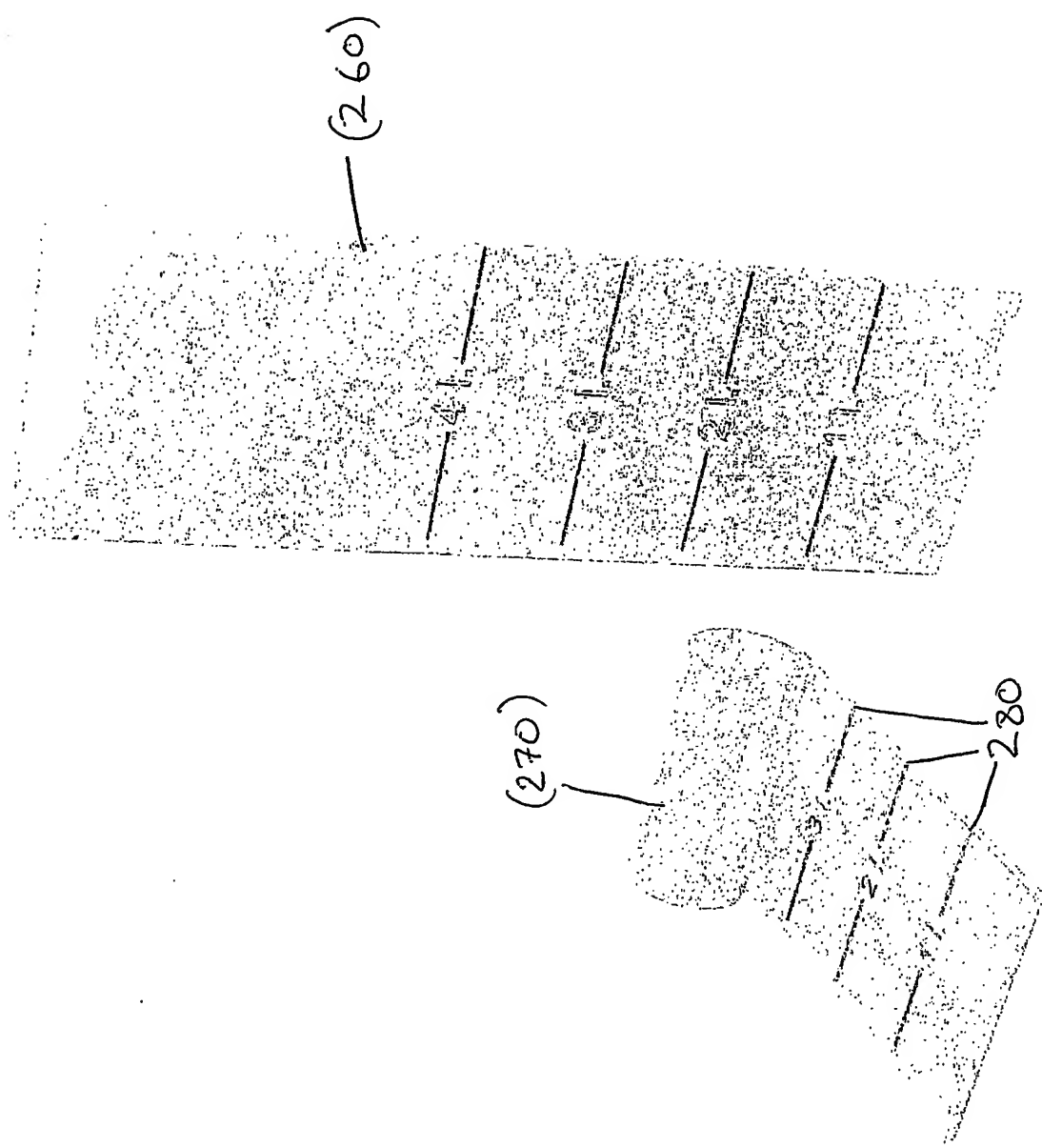
Sondeholder modtages usamløt.
Plastpladen foldes og remmene isættes

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Sondedele - Poser

FIG. 15.



Engangsposer på rulle med skrivfelt og literangivelse.
Posen kan gå i microovnen, køleskab og i fryseren.

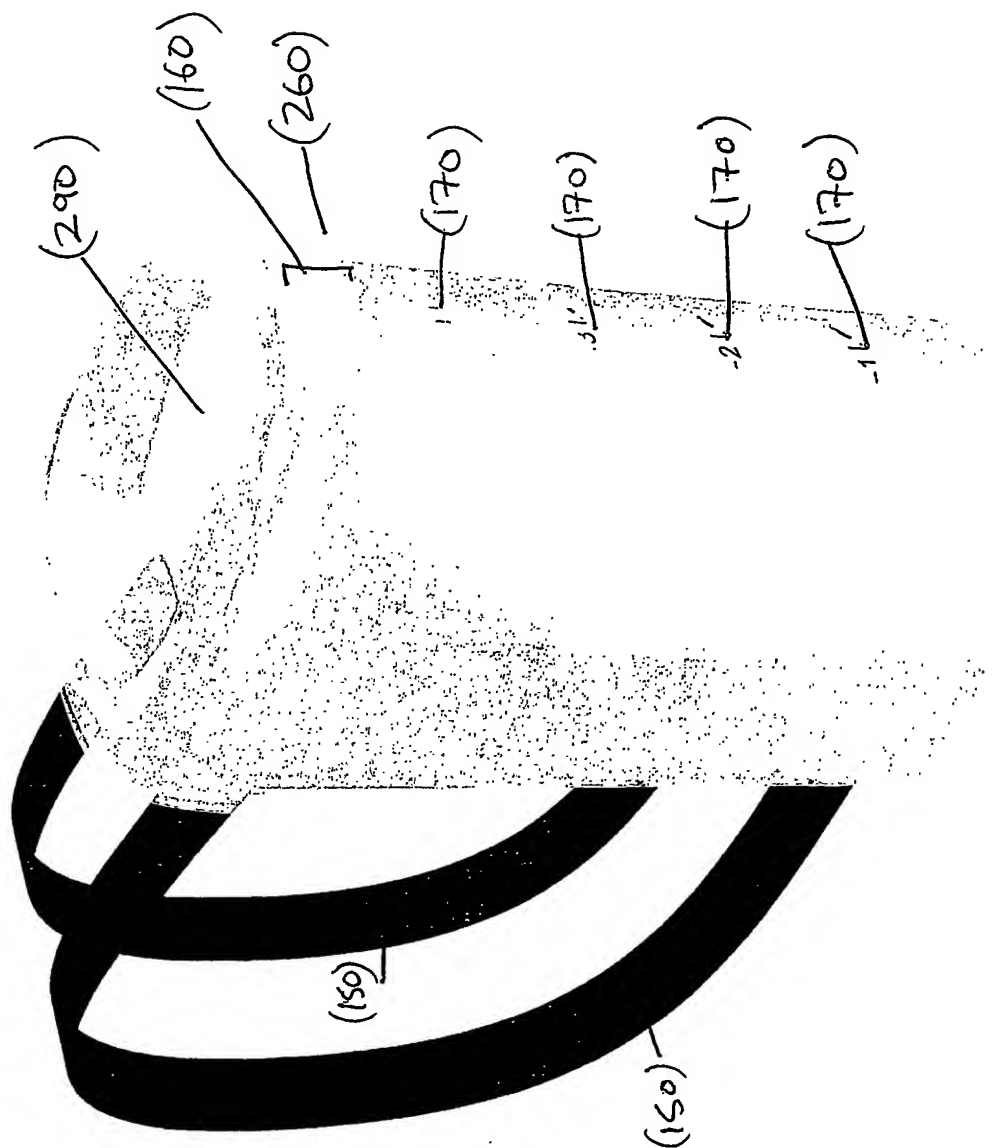
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Brugsanvisning - Pose



FIG. 16



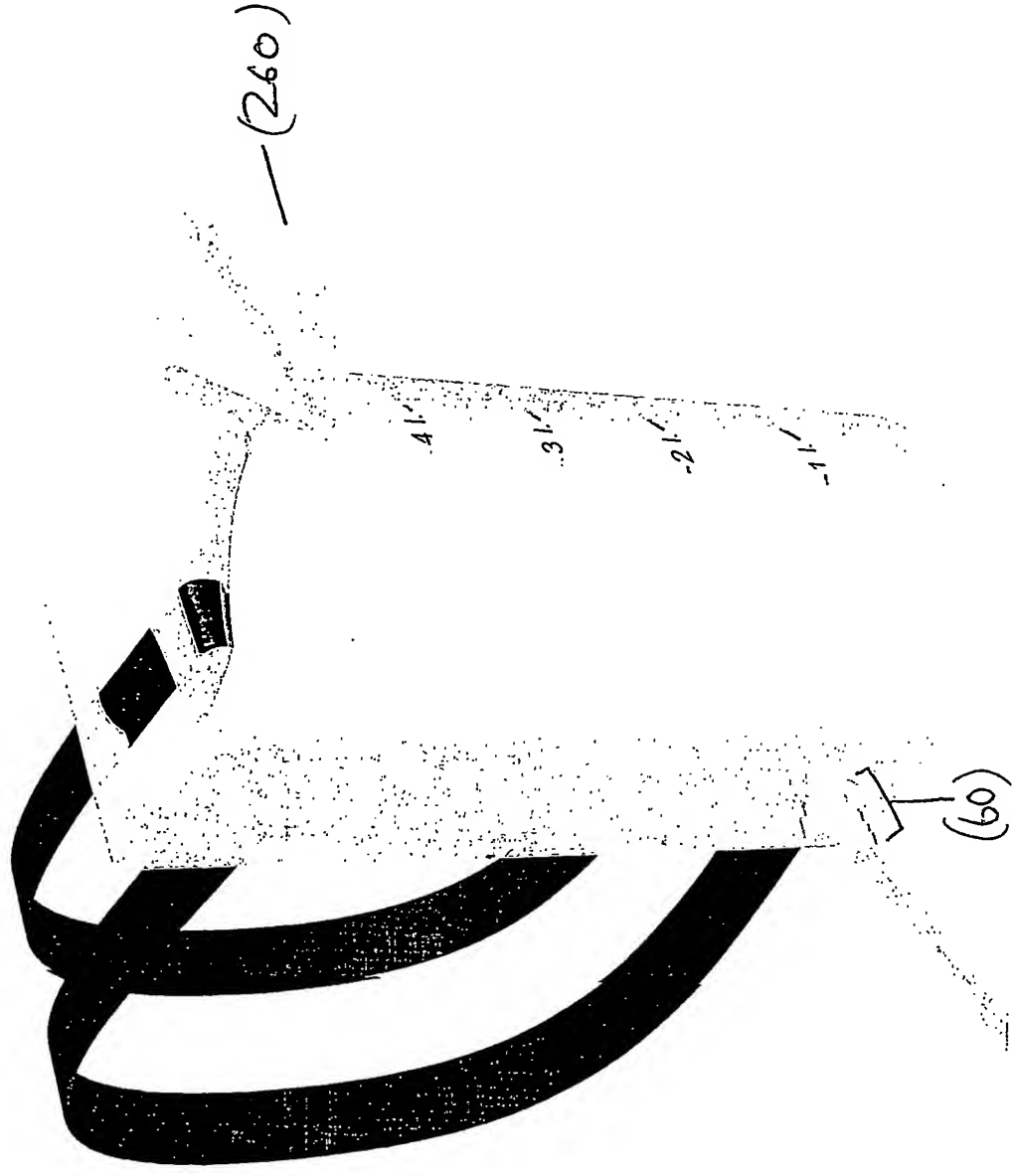
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Engangspose isættes og der fyldes mælk i posen.

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Brugsanvisning - Ophæng

FIG. 17.



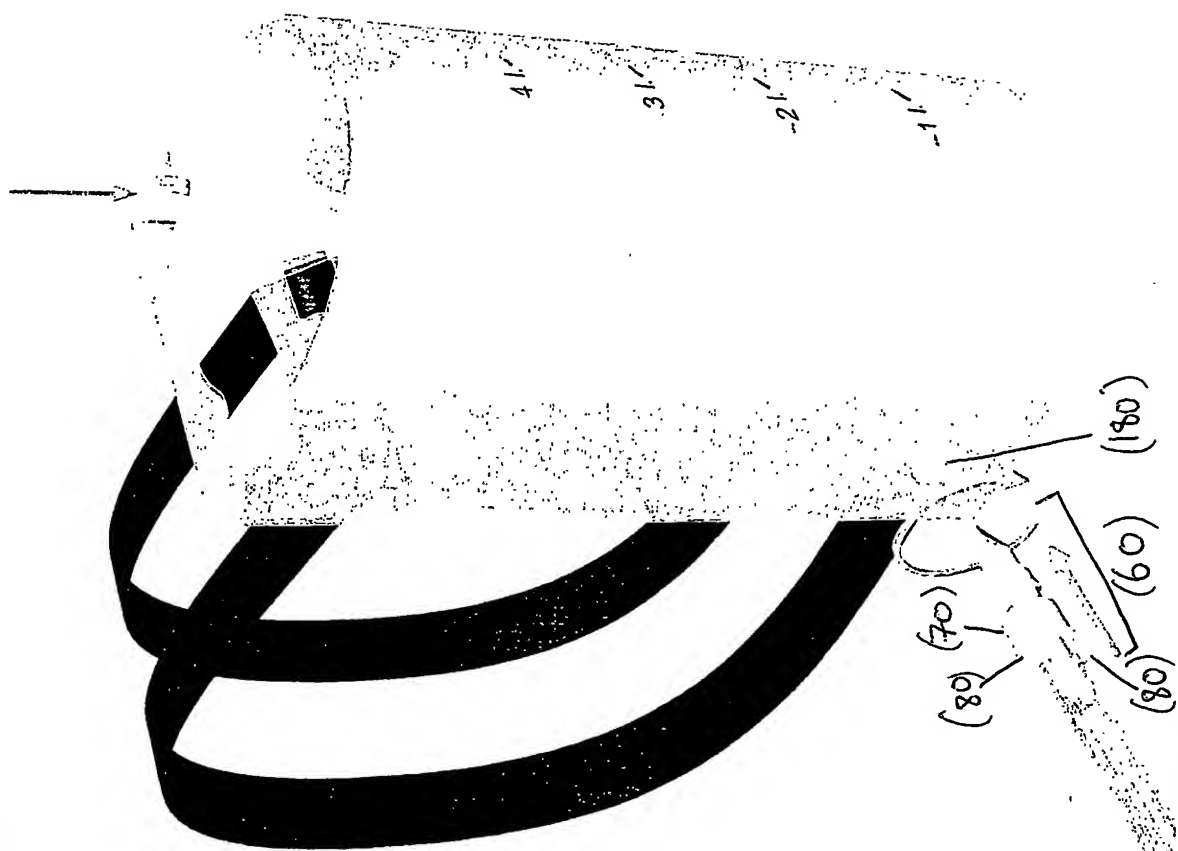
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Posen hænges op i øje i front.

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Brugsanvisning - Spike

FIG. 18



Der bindes knude på posen og der trykkes let fra toppen imens spikeren stikkes ind fra siden og drejes indtil den låser.

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Christian Bjørn Design / Kalvesonde / August 2002 Side [14]

Brugsanvisning - Ophængning

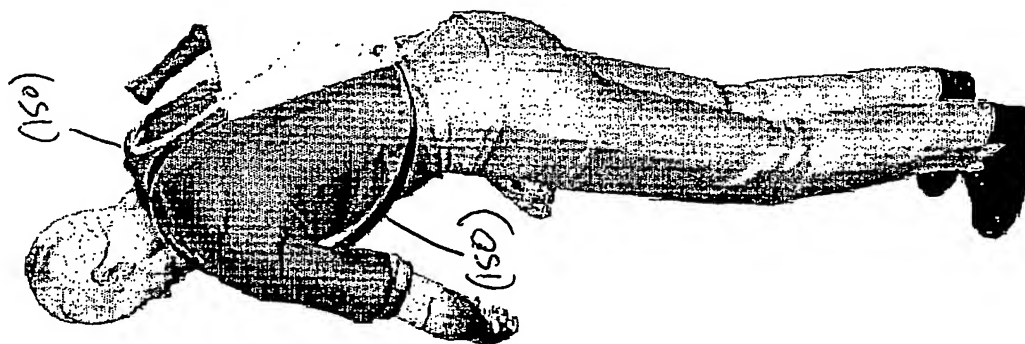


FIG. 19

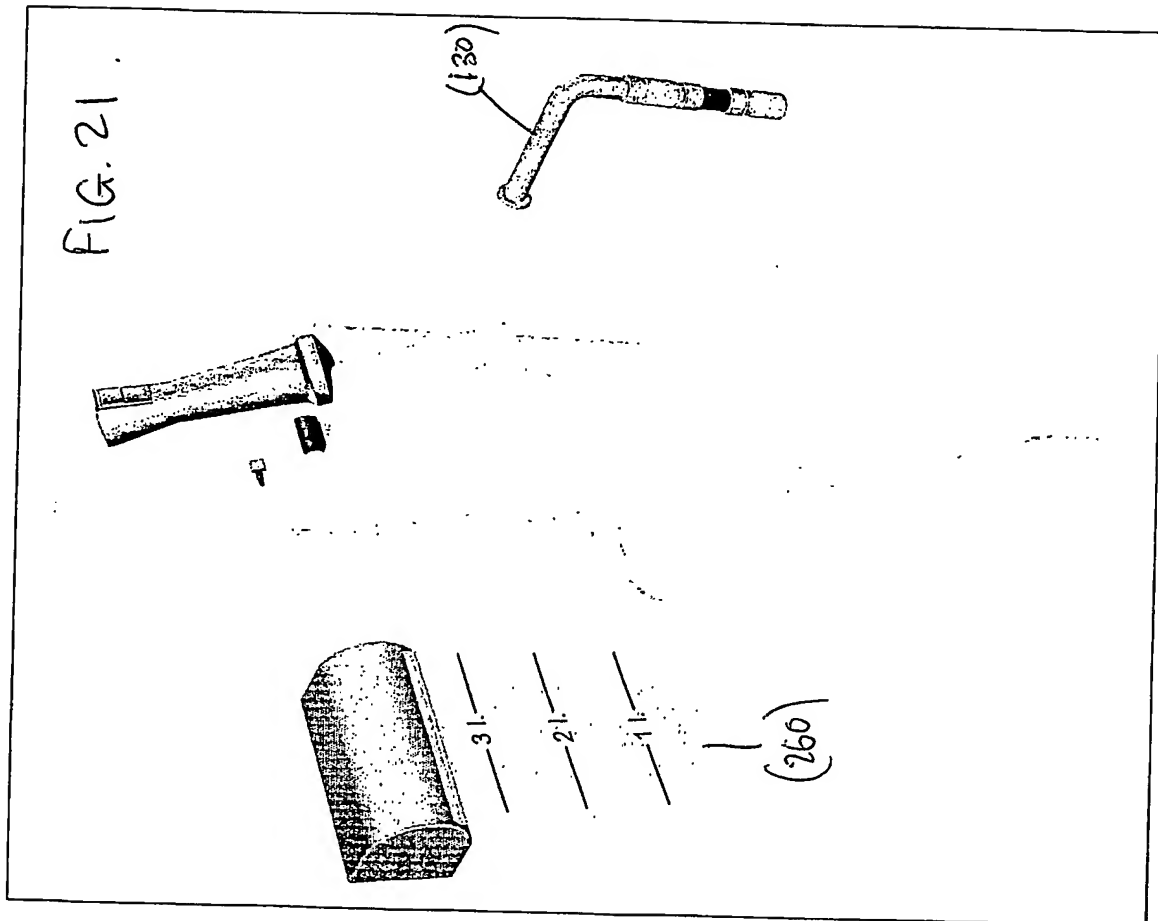
Beholderen kan bæres på ryggen eller hænge i stalden under brug



FIG. 20

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Brugsanvisning - Opbevaring



Sonden hænges på søm i stalden.
Poser hænges op i emballage der også fungerer som opbevaring.

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